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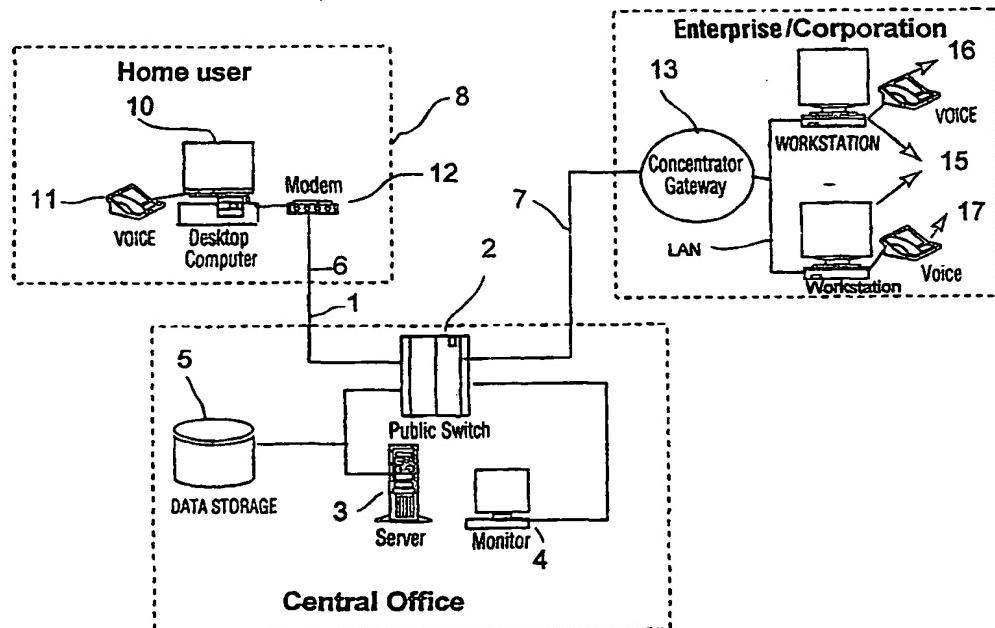
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(54) Title: REMOTE ON-DEMAND APPLICATIONS SERVER



(57) Abstract

A remote on-demand applications server comprises a central multitasking computer connected to a public switched network. Remote client machines can gain access to the central computer by making a call over the network. The central computer makes shared applications programs available to users. Incoming calls are monitored so that access is granted only to authorized users. The usage of individual users is monitored and the system maintains billing records pertaining to the usage of individual users.

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## REMOTE ON-DEMAND APPLICATIONS SERVER

This invention relates to the field of telecommunications, and in particular to a remote on-demand server capable of providing software, unified messaging and other applications from a remote server.

At the dawn of the computer age, users would employ large mainframe computers that required expensive custom-designed software. The inception of the personal computer brought with it the concept of mass-produced software, which due to the fact that it can be run on very large number of machines, can be offered at a relatively low price compared to the cost of designing a custom program. Still, the cost of mass-produced software can run into the hundreds of dollars, which is still significant for the occasional user, who might wish to use a wide variety of programs on an infrequent or one-off basis.

In corporate environments, it is common practice to install a LAN with a central server and a number of clients on the LAN. This allows the clients to share a single multi-user program running on the server. Such servers, however, are traditionally associated with private corporate networks.

Another consideration is the fact that the world of telecommunications is becoming increasingly competitive as new areas of competition open up. For example, in some parts of the world cable companies are beginning to offer local telephone service. As a result there is a need for traditional telephone companies and service providers to expand the range of services that they can offer.

An object of the invention is to address these problems of the prior art.

According to the present invention there is provided a remote on-demand applications server comprising a central multitasking computer, means for connecting said central computer to a public switched network so that remote client machines can gain access thereto by making a call over said network, storage means for storing applications programs available to users, means for monitoring incoming calls so as to grant access only to authorized users, means for monitoring the usage of individual users, and means for maintaining billing records pertaining to the usage of said individual users.

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The public switched network is preferably the telephone network, although it could be a switched data network.

The remote server can be used to provide software, unified messaging and other user applications and allow the customer to be billed on per usage basis. This remote server can be situated at a central office or at the location of an independent service provider

The invention thus provides on-demand software, applications and unified messaging to individual clients as well as small to medium size business. In addition to providing on-demand software the invention also provides "Pay per use" billing or metered billing.

Examples of applications that can be made available by the server are Microsoft Word, Excel, Spread sheet etc. Unified messaging E-mail, voice mail and fax can be accessed from the server. Any software on the server can be accessed by a single or a corporate client. The software only needs to be upgraded at the server level only and every client on that server will have the same latest version.

Call centre, pop-up screen with client information and status, and other similar applications can also be offered and shared through the server. These services can be prescribed as needed basis with a user service billing" structure. The server is preferably partitioned on a per-client account basis to protect client confidentiality.

The server can be accessed from home, corporate office or from any telephone in the world. Since the central offices are interconnected through intra-office trunks, the server software can be shared between central offices as well. These unified messages stored at the server can be accessed at will and can be shared by authorized users. The subscriber can access the server from any telephone regardless of its location. The invention thus provides the capability for telephone companies to offer a virtual office."

Billing services can be arranged so that after user verification, the billing mechanism will log the incoming call and turn on the billing meter. Once the caller has finished using the service, the meter will log-out, the call and customer will be charged for the use of the service and the duration of the service. The billing system can be

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integrated into the telephone billing system so that the customer will get one bill for all services.

The invention will now be described in more detail, by way of example, only with reference to the accompanying drawings, in which:-

Figure 1 is a block diagram of a network employing a remote server in accordance with the invention;

Figure 2 is a flow chart illustrating the operation of the invention; and

Figure 3 is a flow chart illustrating the access procedure.

Referring now to Figure 1, a central office 1 contains a switch 2 for routing calls over the PSTN (Public Switched Telephone Network) in a conventional manner. The central office 1 includes a multitasking computer 3, monitor 4, and mass storage device 5. The computer 3 typically will be a Pentium PC with a large amount of storage or, for example, a digital alpha server running, for example, Windows NT.

The switch 2 is connected via outgoing lines to a home user station 8 and a corporate user station 9 respectively.

The home user station 8 includes a personal computer 10 connected to a telephone set 11 and modem 12, the latter being connected to telephone line 6. The personal computer 10 has a telephone card that provides full functionality for the telephone set 11.

The corporate user station 9 comprises a gateway/concentrator 13 connected to a corporate LAN 14 including workstations 15 with associated respective telephone sets 17.

A single home station 8 or on any workstation 15 on the LAN 14 can access the server 3 via the PSTN and public switch 2 in the central office 1. This is shown in Figure 2. If the home user at home station 8 decides to make a call, he or she calls the central office 1 through the modem 12 using the call services of the personal computer 10. The corporate customer 9 follows a similar procedure, except of course in his or her case the call is routed through the concentrator/gateway 13 attached to the corporate LAN 14.

The call is routed by the switch 2 directly to the server 3 for processing. If it is an outgoing call it will be forwarded to outgoing trunk.

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The call then passes through billing and verification processes. If the call is to check for a voice mail or a Fax or an e-mail, once the caller is verified, then customer will have access to his messaging portion of the server 3.

The call then goes through billing process, which calculates the billing according to predetermined criteria. If the caller wishes to access software, the time of in-coming call will be logged and once the call is dropped the log-out time will also be noted for billing purposes. This data is stored in database 20.

A client accessing the software will be presented with a menu of software. The down load version of the software follows the same format as on a LAN network e.g. application software that cannot be copied or can be used as standalone product.

Figure 3 shows the billing process in more detail. An incoming call 30 is passed to Decision unit 31, which determines whether the system can accept a new call. If yes, the user is prompted for password input, which is verified at step 33. If correct, unit grants access to the server and the user can access the server as if on a conventional LAN.

Unit 35 starts the metering process by switching on a billing meter, which times the usage of the server and stores the billing information for a session in billing mass storage device 20.

It should be understood that once in operation, the server 3 operates in a manner similar to a server on a conventional LAN. The user, with the aid of client software on his local computer, can run programs on the server and, if desired, share them with other authorized users just as he or she would on a conventional network. The essential difference is that, in accordance with the invention, the user has switched access to the server over the public switched network and the server logs his usage for billing purposes. The billing can course depend not only on the usage time, but also on the complexity of the software being accessed. A low cost program, such as an e-mail, would generally attract a low time charge, whereas of course a high-cost program would attract a much higher charge.

One of the advantages of the invention is that an independent service provider can also offer this service through a digital switch or through a PBX.

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Alternatively, a telephone company offering Computer and Telephony Integrated (CTI) services as part of their service offering can easily add the features of the invention, thus enhancing the value of their service. Since the server is connected to a public switch, it can be accessed from any telephone connection in any part of the world.

The invention can also be integrated into the services provided by an Internet service provider.

There are various billing possibilities: Pay-as-you-use is a service that is offered to a client on a juke box concept. The client will have the option of selecting any software on a menu including unified messaging. Flat monthly rate is another possibility and Pay per service is yet another. In this latter service, the customer selects the services and software desired and pays for those services only.

Just as in the case of a conventional LAN, future software updates can be made at the server level instead of at each client station. A single server can provide services to multiple users and enterprises. Using conventional firewall technology, the central server can be partitioned into virtual servers serving groups of customers, each in effect having their own virtual LAN.

The invention thus has the potential to substantially enhance the services offered by telephone companies in the modern communications environment. It also provides an attractive way for software developers to retain some degree of control over the dissemination of their software. Some may choose to offer software only through a central server in which case they will be assured royalties base on actual usage.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A remote on-demand applications server comprising a central multitasking computer, means for connecting said central computer to a public switched network so that remote client machines can gain access thereto by making a call over said network, storage means for storing applications programs available to users, means for monitoring incoming calls so as to grant access only to authorized users, means for monitoring the usage of individual users, and means for maintaining billing records pertaining to the usage of said individual users.
2. A remote on-demand applications server as claimed in claim 1, wherein said central multitasking computer is located in a central office.
3. A remote on-demand applications server as claimed in claim 1, wherein said central multitasking computer is located at a central service provider.
4. A remote on-demand applications server as claimed in claim 2, wherein said central multitasking computer is connected to a public switch to provide switched access thereto over the public switched telephone network.
5. A remote on-demand applications server as claimed in claim 2, wherein said applications programs are run on said central multitasking computer remotely for said clients on a shared basis.
6. A remote on-demand applications server as claimed in claim 2, wherein said applications programs are download from said central computer over said switched network on an as-needed basis.
7. A remote on-demand applications server as claimed in claim 1, wherein said public switched network is the public telephone network.
8. A computer system comprising a central multitasking computer connected to a public switched network, a plurality of remote clients connected to said public switched network that can gain access to said central computer by making a call over said network, storage means for storing applications programs available to users, means for monitoring incoming calls so as to grant access only to authorized users, means for monitoring the

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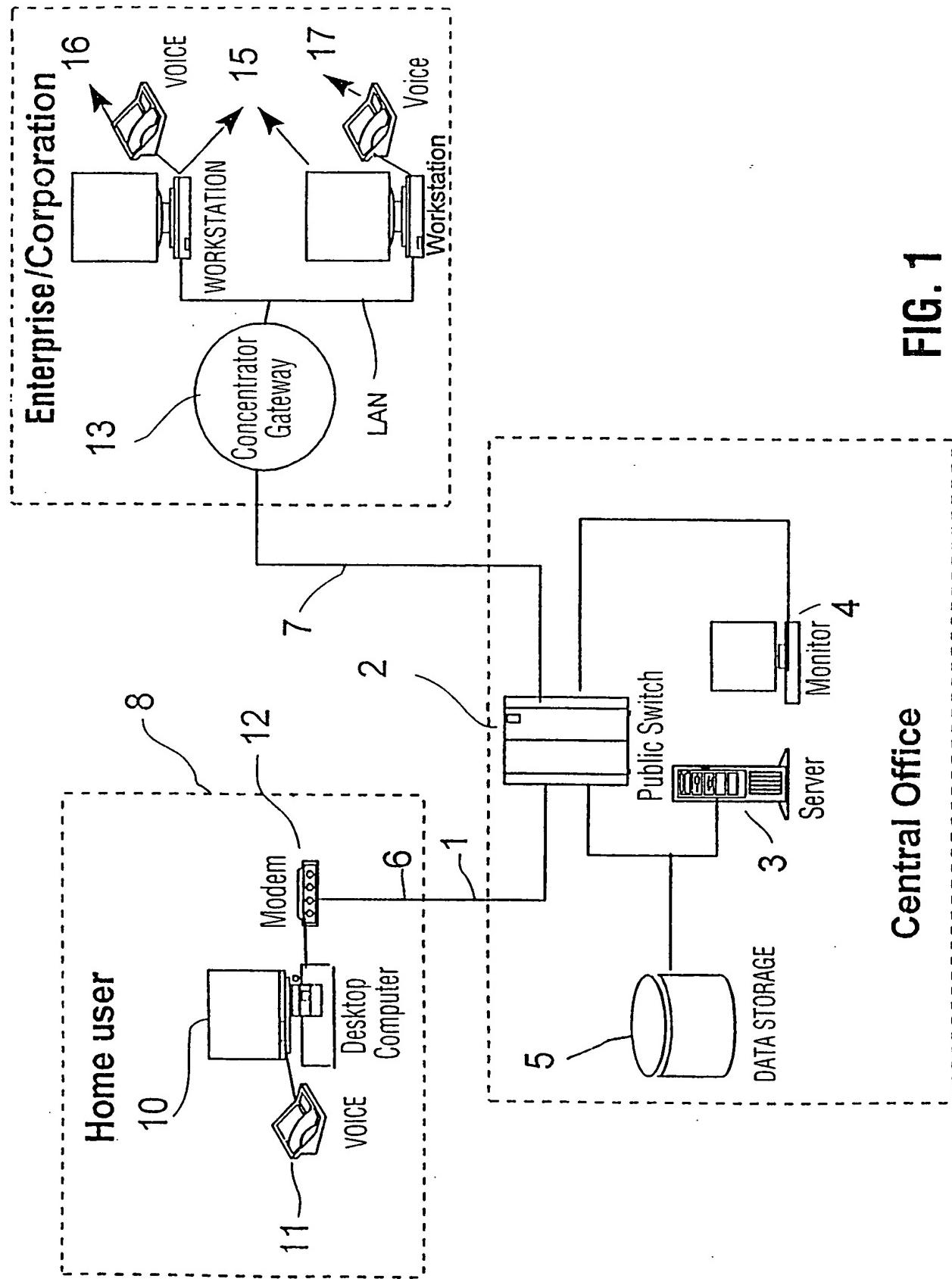
usage of individual users, and means for maintaining billing records pertaining to the usage of said individual users, whereby said remote clients can access said server over a virtual switched LAN incorporating said public switched network on a paying basis.

9. A computer system as claimed in claim 7, wherein said remote clients are individual personal computers.

10. A computer system as claimed in claim 7, wherein said remote clients are corporate users connected to a LAN connected to said public switched network via a gateway concentrator.

11. A computer system as claimed in claim 7, wherein said applications programs include e-mail.

12. A computer system as claimed in claim 7, wherein said applications programs include word processing programs.

**FIG. 1**

Central Office

2/3

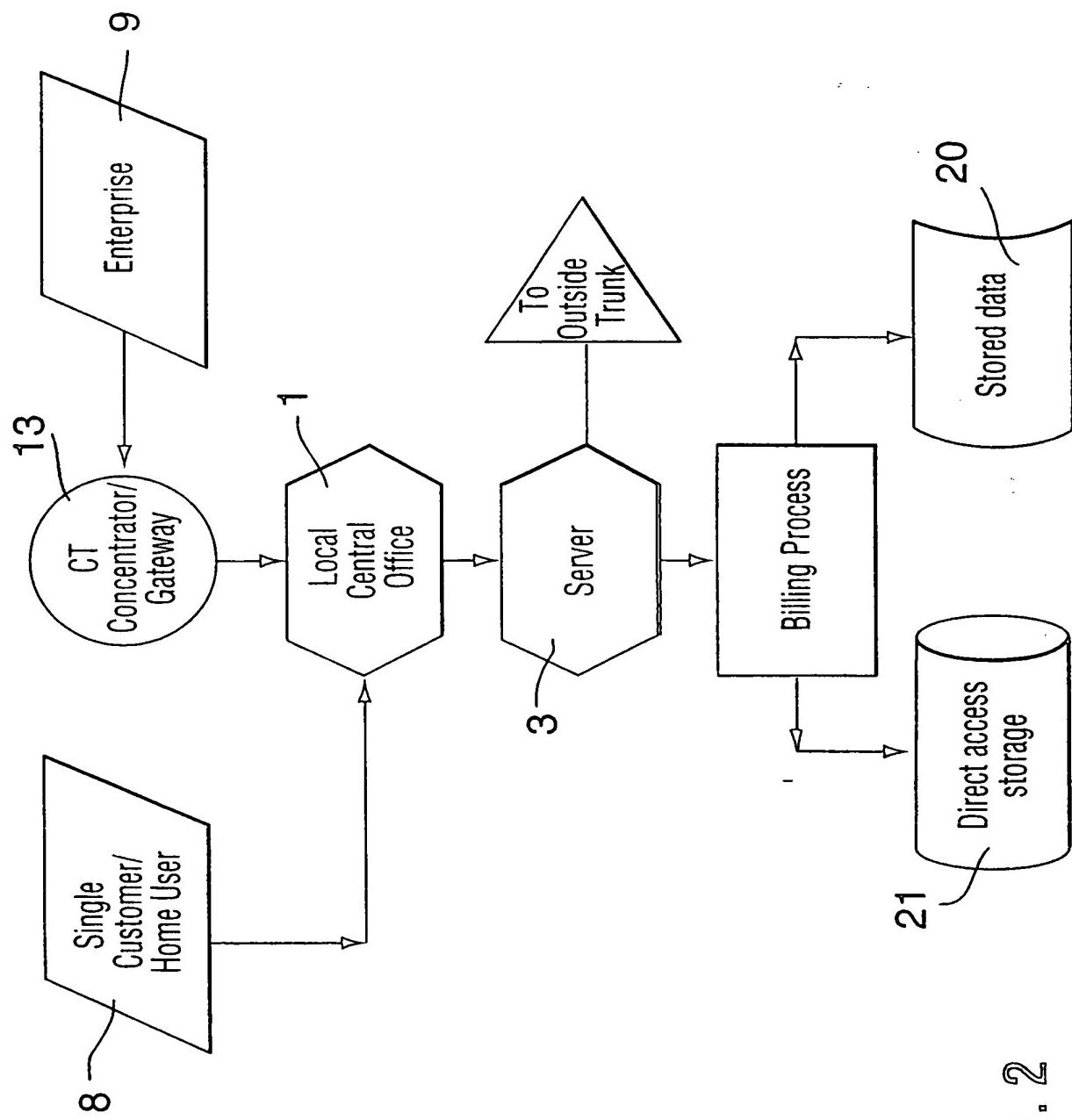


FIG. 2

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